INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/39692

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : H04Q 7/20
US CL : 455/456.6
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 455/456.1-456.6, 414.1, 404.1-404.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2003/0008669 A1 (STEIN et al) 09 January 2003 (09.01.2003), whole document	1-3, 5-6, 9-10, 14, 16-17, 19-28, 31-32, 35-36, 39, 41-43, 45, 48-49, 52, 54-64 --- 4, 7-8, 11, 13, 15, 18, 29-30, 33-34, 40, 44, 46-47, 50, 53
X	US 2002/0115448 A1 (AMERGA et al) 22 August 2002 (22.08.2002) whole document	1-3, 5-6, 12, 16-17, 19-23, 27-28, 32, 35, 38, 41-43, 45, 48, 51
Y	US 6,166,685 A (SOLIMAN) 26 December 2000 (26.12.2000), column 3, lines 27-40, column 1, lines 8-15	11, 13, 37, 30,
Y	US 6,198,935 B1 (SAHA et al) 03 March 2001 (06.03.2001), column 4, lines 2-7	18, 40, 53
Y	US 6,330,454 B1 (VERDONK) 11 December 2001 (11.12.2001), abstract	7, 33, 46

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 May 2005 (18.05.2005)	13 JUL 2005
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Olivia Marsh Telephone No. 703-305-4700

Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/39692

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0050077 A1 (TAKEUCHI et al) 13 March 2003 (13.03.2003), paragraph 20, 25, 27	4, 29-30, 44,
Y	US 5,734,977 A (SANMUGAM) 31 March 1998 (31.03.1998), column 3, lines 66-67, column 4, lines 1-5	15

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
PHILIP R. WADSWORTH
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SAN DIEGO, CA 92121

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	13 JUL 2005
Applicant's or agent's file reference 040132WO	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US04/39692	24 November 2004 (24.11.2004)	26 November 2003 (26.11.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): H04Q 7/20 and US Cl.: 455/456.6

Applicant

QUALCOMM INCORPORATED

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US
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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/39692

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/39692

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims NONE	YES
	Claims 1-64	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-64	NO
Industrial applicability (IA)	Claims 1-64	YES
	Claims NONE	NO

2. Citations and explanations:

Please See Continuation Sheet

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V. 2. Citations and Explanations:
Claims 1-3, 5-6, 9-10, 14, 16-17, 19-27, 31-32, 35-36, 39, 41-43, 45, 48-49, 52, and 54-64 fail to meet novelty under PCT Article 33(2) as being anticipated by Stein.

Regarding **claim 1**, Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "collecting in a mobile station, position estimate information PEI transmitted by a location node." Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "generating in the mobile station, PEI parameters based upon the PEI, wherein the PEI parameters include information from which the location node can be uniquely located or identified." Stein further discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138), reading on claimed "sending the PEI parameters from the mobile station to a position determination entity, wherein the PEI parameters permit calculation of the position estimate."

Regarding **claim 27**, Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135). Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138). Stein also discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138). Stein also discloses the PDE 130 receives the reverse modulated signal from the terminal and it is processed by transceiver 814 to provide samples (paragraph 143), reading on claimed "receiving in a position determination entity, the PEI parameters which have been sent by the mobile station," to a RX data processor 822 to recover the data transmitted by the terminal which may include any combination of measurements, identifier PNs reported by the terminal (paragraph 143), reading on claimed "the PEI parameters including information from which the location node can be located or identified." Stein further discloses the data processor 822 provides the received data to controller 810 (paragraph 143) which estimates the position for the terminal based on the data from the terminal and additional data from storage unit 830 (paragraph 144), reading on claimed "calculating the position estimate of the mobile station based upon the PEI parameters."

Regarding **claim 42**, Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "a location node configured for transmitting position estimate information (PEI) to the mobile station." Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received

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signals, or any combination thereof (paragraph 138), reading on claimed "mobile station having generated the PEI parameters based upon the PEI, and wherein the PEI parameters include information from which the location node can be located or identified." Stein also discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138). Stein also discloses the PDE 130 receives the reverse modulated signal from the terminal and it is processed by transceiver 814 to provide samples (paragraph 143), reading on claimed "a position determination entity for receiving the PEI parameters sent by the mobile station," to a RX data processor 822 to recover the data transmitted by the terminal which may include any combination of measurements, identifier PNs reported by the terminal (paragraph 143). Stein further discloses the data processor 822 provides the received data to controller 810 (paragraph 143) which estimates the position for the terminal based on the data from the terminal and additional data from storage unit 830 (paragraph 144), reading on claimed "a processor associated with the position determination entity, the processor calculating the position estimate of the mobile station based upon the PEI parameters."

Regarding **claims 2, 28, 43**, Stein discloses everything as stated in claims 1, 27, and 42 above, and he further discloses the PDE can automatically send to the terminal a list of PNs to search including the identifier PNS, which may be used for position related calls (paragraph 140), reading on claimed "receiving in the mobile station, a location request message from the PDE and initiating the generating of the PEI parameters responsive to the location request message."

Regarding **claims 3**, Stein discloses everything as stated in claim 1 above, and he further discloses the PDE can send the identifier PNs to a terminal upon request when it is known that repeaters are present and there are not enough GPS measurements to perform position determination (paragraph 140), reading on claimed "initiating the generating of the PEI parameters responsive to a location request generated by the mobile station."

Regarding **claims 5**, Stein discloses everything as stated in claim 1 above, and he further discloses the RF receiver unit 722 may be operated to provide a controller 730 the arrival times for the strongest received multipaths or the multipaths having signal strengths that exceed a particular threshold (paragraph 136), reading on claimed "the PEI parameters include the time which the mobile station receives the PEI."

Regarding **claims 6, 31, and 45**, Stein discloses everything as stated in claims 1, 27, and 42 above, and he further discloses one or more repeaters 114 may be employed by system 100 to provide coverage for regions that would not otherwise be covered by a base station (paragraph 7). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135). Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "PEI parameters indicate whether or not the mobile station is currently in view of the location node." It is inherent that if the mobile station has received the PN sequence from repeater 114 that it is not in view of the base station.

Regarding **claims 9, 35, 48**, Stein discloses everything as stated in claims 1, 27, and 42 above, and he further discloses the RF receiver unit 722 may be operated to provide a controller 730 the arrival times for the strongest received multipaths or the multipaths having signal strengths that exceed a particular threshold (paragraph 136), reading on claimed "if the mobile station is currently in view of the location node, the PEI parameters include information relating to proximity of the mobile station relative to the location node."

Regarding **claims 10, 36, 49**, Stein discloses everything as stated in claims 1, 9, 27, 35, 42 and 48 above, and he further discloses the RF receiver unit 722 may be operated to provide a controller 730 the arrival times for the strongest received multipaths or the multipaths having signal strengths that exceed a particular threshold (paragraph 136), reading on claimed "the information relating to the proximity of the mobile station relative to the location node comprises the signal strength of the location node."

Regarding **claims 12, 38, 51**, Stein discloses everything as stated in claims 1, 9, 27, 35, 42 and 48 above, and he further discloses using round trip delay (RTD) measurements to locate a terminal (paragraph 18) when the terminal is in view of a repeater (paragraph 146), reading on claimed "information relating to the proximity of the mobile station relative to the location node comprises a signal-to-interference ratio of the location node."

Regarding **claims 14**, Stein discloses everything as stated in claim 1 above, and he further discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "the PEI parameters include the channel identification at which the mobile station and the location node communicate."

Regarding **claims 16**, Stein discloses everything as stated in claim 1 above, and he further discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "the PEI

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parameters include information which identifies a transmitter type of the location node."

Regarding **claims 17, 39, 52,** Stein discloses everything as stated in claims 1, 27, and 42 above, and he further discloses system 100 may be designed to conform to systems such as WCDMA, CDMA 2000, or IS-95 (paragraph 6) and this system comprises a PDE 130 that receives time measurements and/or identification codes from the terminals and provides control and other information related to position determination (paragraph 9), reading on claimed "the PDE comprises a PDE operating in a code division access network."

Regarding **claims 19, 59,** Stein discloses everything as stated in claims 1, 42 above, and he further discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "the location node comprises a base station."

Regarding **claims 20, 60,** Stein discloses everything as stated in claims 1 and 42 above, and he further discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "the location node comprises a wireless access point."

Regarding **claims 21, 61,** Stein discloses everything as stated in claims 1 and 42 above, and he further discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "the location node comprises a GPS satellite."

Regarding **claims 22, 41, 54,** Stein discloses everything as stated in claims 1, 27, and 42 above, and he further discloses the RF receiver unit 722 conditions and digitizes the received signal to provide samples (paragraph 135) to the controller 730 which receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "collecting in the mobile station, the PEI transmitted by a plurality of location nodes and generating in the mobile station, the PEI parameters based upon the PEI collected from the plurality of location nodes, wherein the PEI parameters include information which identifies the location of at least one of the plurality of location nodes."

Regarding **claims 23, 55,** Stein discloses everything as stated in claims 1, 22, and 42 above, and he further discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "each of the plurality of location nodes comprise a different type of transmission entity."

Regarding **claims 24, 56,** Stein discloses everything as stated in claims 1 and 42 above, and he further discloses a PN sequence, reading on claimed "SPM," is used to generate the pilot references and to spread data at the base stations and it is continually repeated to generate a continuous spreading sequence that is then used to spread pilot and traffic data (paragraph 47), reading on claimed "PEI comprises a system parameters message (SPM)."

Regarding **claims 25, 57,** Stein discloses everything as stated in claims 1 and 42 above, and he further discloses a PN sequence, reading on claimed "SPM," is used to generate the pilot references and to spread data at the base stations and it is continually repeated to generate a continuous spreading sequence that is then used to spread pilot and traffic data that is defined by the CDMA standard (paragraph 47), reading on claimed "PEI comprises a standard code division multiple access (CDMA) system parameters message (SPM)."

Regarding **claims 26, 58,** Stein discloses everything as stated in claims 1 and 42 above, and he further discloses the identification code uniquely associated with each repeater is sent by each repeater within a particular coverage area and the identification codes comprise PN sequences at defined offsets (paragraph 21), reading on claimed "the PEI is a broadcast message from the location node."

Regarding **claim 32,** Stein discloses everything as stated in claim 27 above, and he further discloses the PDE 130 receives the reverse modulated signal from the terminal and it is processed by transceiver 814 to provide samples (paragraph 143), reading on claimed "receiving in a position determination entity, the PEI parameters which have been sent by the mobile station," to a RX data processor 822 to recover the data transmitted by the terminal which may include any combination of measurements, identifier PNs reported by the terminal (paragraph 143), reading on claimed "PEI parameters include a pseudo-random noise (PN) code index of the location node."

Regarding **claim 62,** Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x, reading on claimed "mobile station," receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "collecting in a mobile station, position estimate information PEI transmitted by a location node." Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "generating in the mobile station, PEI parameters based upon the PEI, wherein the PEI parameters include information from which the location node can

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be uniquely located or identified." Stein further discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138), reading on claimed "sending the PEI parameters from the mobile station to a position determination entity, wherein the PEI parameters permit calculation of the position estimate." Stein further discloses the data processor 822 of the PDE provides the received data to controller 810 of the PDE (paragraph 143) which estimates the position for the terminal based on the data from the terminal and additional data from storage unit 830 (paragraph 144), reading on claimed "a computer readable medium containing instructions for controlling a computer which calculates a position estimate of a mobile station."

Regarding **claim 63**, Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135). Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "mobile station having generated position estimate information parameters based upon PEI transmitted by a location node." Stein also discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138). Stein also discloses the PDE 130 receives the reverse modulated signal from the terminal and it is processed by transceiver 814 to provide samples (paragraph 143), reading on claimed "receiving in a position determination entity, the PEI parameters which have been sent by the mobile station," to a RX data processor 822 to recover the data transmitted by the terminal which may include any combination of measurements, identifier PNs reported by the terminal (paragraph 143), reading on claimed "the PEI parameters including information from which the location node can be located or identified." Stein further discloses the data processor 822 provides the received data to controller 810 (paragraph 143) which estimates the position for the terminal based on the data from the terminal and additional data from storage unit 830 (paragraph 144), reading on claimed "a computer readable medium containing instructions for controlling a computer for calculating a position estimate of a mobile station" and "calculating the position estimate of the mobile station based upon the PEI parameters."

Regarding **claim 64**, Stein discloses a method and apparatus to determine the position of a terminal communicating through a repeater in a wireless communication system (paragraph 20). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135), reading on claimed "transmitting means for transmitting position estimate information (PEI) to the mobile station." Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "mobile station having generated the PEI parameters based upon the PEI, and wherein the PEI parameters include information from which the location node can be located or identified." Stein also discloses the measurements and identifier PNs are provided to a TX data processor 742 for transmission back to the PDE, which uses the information to determine the position of terminal 106x (paragraph 138). Stein also discloses the PDE 130 receives the reverse modulated signal from the terminal and it is processed by transceiver 814 to provide samples (paragraph 143), reading on claimed "locating means for receiving the PEI parameters sent by the mobile station," to a RX data processor 822 to recover the data transmitted by the terminal which may include any combination of measurements, identifier PNs reported by the terminal (paragraph 143). Stein further discloses the data processor 822 provides the received data to controller 810 (paragraph 143) which estimates the position for the terminal based on the data from the terminal and additional data from storage unit 830 (paragraph 144), reading on claimed "processing means associated with the locating means, the processing means calculating the position estimate of the mobile station based upon the PEI parameters."

Claims 4, 29, 30, and 44 fail to meet an inventive step under PCT Article 33(3) as being obvious over Stein in view of Takeuchi.

As to **claims 4, 30, 44**, Stein discloses everything as applied in claims 1, 27, and 42 above; however he fails to disclose the PEI parameters include latitude and longitude of the location node. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Takeuchi.

Takeuchi teaches an invention for finding the position of the mobile communications terminal (paragraph 2). Takeuchi also teaches the overhead information received by the mobile station contains serving base station PN codes and identification signals, position information of the base station (latitude and longitude), usable frequencies, a neighbor list of peripheral base stations, and a network ID (paragraph 20). Takeuchi also teaches the terminal information and the aquired peripheral information are reported to the position server PDE (paragraph 25). Takeuchi further teaches the PDE calculated the terminal based on the positioning information sent from the terminal MS (pargarph 27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further require the method and system and PEI parameters, disclosed by Stein, the PEI parameters including the latitude and longitude of the location node, as taught by Takeuchi, to enhance the ability of the PDE to determine the location of the mobile station.

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As to claim 29, Stein discloses everything as applied in claim 27; however, he fails to disclose sending position estimate to the mobile station. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Takeuchi.

Takeuchi also teaches the terminal MS receives the postitioning result calculated by the position server PDE (paragraph 27).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further require the method and system, disclosed by Stein, to send the position estimate to the mobile station, as taught by Takeuchi, to inform the mobile subscriber of its location.

Claims 7, 33, 46 fail to meet an inventive step under PCT Article 33(3) as being obvious over Stein in view of Verdonk.

As to **claims 7, 33, and 46**, Stein discloses everything as applied in claims 1, 27, and 42 above and he further discloses one or more repeaters 114 may be employed by system 100 to provide coverage for regions that would not otherwise be covered by a base station (paragraph 7). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135). Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "wherein if the mobile station is not currently in view of the location node." It is inherent that if the mobile station has received the PN sequence from repeater 114 that it is not in view of the base station. However, Stein fails to disclose the PEI parameters include information relating to elapsed time which the mobile station has been out of view of the location node. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Verdonk.

Verdonk teaches the serving MSC may also convert a time-stamp associated with the location information (when the location information was last recorded) to a normalized time standard such as GST (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system and PEI parameters, disclosed by Stein, and the mobile station not in view of the location node, also disclosed by Stein, that the PEI parameters include information relating to elapsed time which the mobile station has been out of view of the location node, as taught by Verdonk, in order to provide the most likely location of the mobile unit within the system.

Claims 8, 11, 13, 34, 37, 47, and 50 lack an inventive step under PCT Article 33(3) as being obvious over Stein in view of Soliman.

As to **claims 8, 34, and 47**, Stein discloses everything as applied in claims 1, 27, and 42 above and he further discloses one or more repeaters 114 may be employed by system 100 to provide coverage for regions that would not otherwise be covered by a base station (paragraph 7). Stein also discloses a terminal 106x receives signals from GPS satellites, base stations, and/or repeaters (paragraph 135). Stein also discloses the controller 730 receives the measurements for the base stations and/or GPS satellites, the PN sequences for the base stations, the identifier PNs of the repeaters, the estimated signal quality of the received signals, or any combination thereof (paragraph 138), reading on claimed "wherein if the mobile station is not currently in view of the location node." It is inherent that if the mobile station has received the PN sequence from repeater 114 that it is not in view of the base station. However, Stein fails to disclose the PEI parameters include velocity estimation of the mobile station. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Soliman.

Soliman teaches an invention where the position of the mobile radio unit is tracked as the unit moves about the system (column 1, lines 8-9). Soliman also teaches the motion of the mobile station is modeled in order to estimate the current direction and velocity of the mobile station (column 4, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system and PEI parameters, disclosed by Stein, and the mobile station not in view of the location node, also disclosed by Stein, that the PEI parameters include velocity estimation of the mobile station, as taught by Soliman, in order to enable tiered services to be implemented and used by the mobile station that required the location of the mobile station to be tracked while it is active within the system.

As to **claims 11, 37, and 50**, Stein discloses everything as applied in claims 1, 27, and 42 above; however, he fails to disclose the information relating to the proximity of the mobile station relative to the location node comprises a signal-to-interference ratio of the location node. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Soliman.

Soliman also teaches infrastructure measurements that are used to perform the position updating include round-trip-dealy RTD and signal-to-noise ratio (SNR) measurements (column 3, lines 34-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system, disclosed by Stein, that the information relating to the proximity of the mobile station relative to the location node comprises a signal-

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to-interference ratio of the location node, as taught by Soliman, in order to estimate the change in position of the mobile station within the system using such measurements.

As to **claim 13**, Stein discloses everything as applied in claim 1; however, he fails to disclose the PEI parameters include a direction of motion of the mobile station. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Soliman.

Soliman teaches an invention where the position of the mobile radio unit is tracked as the unit moves about the system (column 1, lines 8-9). Soliman also teaches the motion of the mobile station is modeled in order to estimate the current direction and velocity of the mobile station (column 4, lines 1-4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system and PEI parameters, disclosed by Stein, that the PEI parameters include a direction of motion of the mobile station, as taught by Soliman, in enable a service provider to provide wireless applications to subscribers that would allow the subscriber to obtain child and pet tracking services.

Claim 15 lack an inventive step under PCT Article 33(3) as being obvious over Stein in view of Sanmugam.

As to **claim 15**, Stein discloses everything as applied in claim 1; however, he fails to disclose the PEI parameters include information that identifies a device type of the mobile station. The Examiner maintains this was old and well known in the art at the time of invention as taught by Sanmugam.

Sanmugam teaches a method and system for fraud detection and supervision in a cellular radio telephone system (column 1, lines 6-7). Sanmugam also teaches several information elements are used to identify and validate a legitimate subscriber (column 3, lines 40-41). Sanmugam also teaches these elements include the MIN, which identifies the service subscription, the EIN, which identifies the mobile station (column 3 lines 42-44) and a station class mark (SCM) which designates the transmit power class, mode, and bandwidth for the mobile station (column 3, lines 66-67; column 4, lines 1-2). Sanmugam further teaches the SCM information is transmitted along with the MIN/ESN at system access to enable the system to identify the operating parameters of the mobile station (column 15, lines 14-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system and PEI parameters, disclosed by Stein, that the PEI parameters include information which identifies a device type of the mobile station, as taught by Sanmugam, to prevent unauthorized use of the location determination services of the serving system.

Claims 18, 40, 53 lack an inventive step under PCT Article 33(3) as being obvious over Stein in view of Saha.

As to **claims 18, 40, 53**, Stein discloses everything as applied in claims 1, 27, and 42; however he fails to disclose the position determination entity comprises a service mobile location center (SMLC) operating in a global system for the mobile communication (GSM) network. The Examiner maintains this feature was old and well known in the art at the time of invention as taught by Saha.

Saha teaches a system and method for enhanced tie of arrival measurements for mobile station positioning utilizing geographical characteristics of the mobile communications network (column 1, lines 10-12). Saha also teaches mobile telecommunications network 1 comprises a MLC 5 that may serve as a gateway mobile location center (GMLC) 6 which an external location area 7 may acces in requesting a determination of a mobile station position (column 4, lines 2-5). Saha further teaches the MLC 5 serving mobile station 3 is referred to as the serving mobile station location center (SMLC) (column 4, liens 5-7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to require the method and system and the PDE, disclosed by Stein, the PDE comprising a service mobile location center (SMLC) operating in a global system for the mobile communication (GSM) network, as taught by Saha, to optimally balance accurately determining the position of a mobile station within a mobile telecommunication network against providing wireless speech communication.